

WHAT IS CLAIMED IS:

1. A data recording equipment for recording data by irradiating an optical disc with a laser beam and for interrupting the recording of data when detecting an external shock that hinders the recording of data or when predicting the occurrence of a buffer underrun error, the data recording equipment comprising:

a counter for counting execution of recording data on the optical disc and generating a count value indicating the amount of data that is recorded; and

a control unit connected to the counter for holding the count value of the counter immediately before the interruption when the recording of data is interrupted and re-irradiating a position on the optical disc, on which data prior to the data recorded immediately before the interruption is recorded, with the laser beam;

wherein the control unit controls restart of the recording of data based on the held count value while recognizing the position of data on the optical disc.

2. The data recording equipment according to claim 1, wherein the counter counts includes:

a first counter for generating a first count value by counting units of a predetermined data amount, the predetermined data amount units each being obtained by dividing a minimum unit of a disc format by a predetermined integer, the disc format including address information, wherein the first counter is initialized when the first count value reaches the minimum unit; and

a second counter for generating a second count value by counting the data in bit units, wherein the second counter is initialized when the second count value becomes equal to

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the predetermined data amount unit of the first counter;

wherein the control unit stores at least the first counter value of the first counter;

wherein the first and second counter each perform
5 counting prior to the restart of the recording in
correspondence with the position of the optical disc re-
irradiated by the laser beam, the data recording equipment
further comprising:

an information memory device for storing a history of
10 the initialization of the first counter when the recording
is interrupted; and

wherein the control unit controls restart of the
recording using at least the first count value stored
therein and the first count value counted prior to the
15 restart of recording after confirming that the history
stored in the information memory device matches the position
of the optical disc re-irradiated by the laser beam.

3. The data recording equipment according to claim 1,
20 further comprising:

a demodulation circuit for reproducing disc position
information that is recorded on the optical disc from the
position re-irradiated by the laser beam before the
recording is restarted; and

25 an information memory device connected to the
demodulation circuit for storing the disc position
information when the recording is interrupted;

wherein the counter counts includes a first counter and
a second counter, wherein the first counter counts units of
30 a predetermined data amount to generate a first count value,
the predetermined data amount units each being obtained by
dividing a minimum unit of a disc format by a predetermined
integer, the disc format including address information,

wherein the first counter is initialized when the first count value reaches the minimum unit, wherein the second counter counts the data in bit units to generate a second count value, the second counter being initialized when the second count value becomes equal to the predetermined data amount unit of the first counter;

wherein the first and second counter each perform counting prior to the restart of the recording in relation with the position of the optical disc re-irradiated by the laser beam; and

wherein the control unit controls restart of the recording using at least the first count value stored therein and the first count value counted prior to the restart of recording after detecting matching of the disc position information reproduced before the recording is restarted and the disc position information stored in the information memory device.

4. The data recording equipment according to claim 1, wherein the data recording equipment restarts the recording from the data which recording was interrupted.

5. The data recording equipment according to claim 1, further comprising:

an encoder for encoding data provided from an external device, wherein the encoder performs encoding based on the count value of the counter.

6. The data recording equipment according to claim 5, further comprising:

a buffer memory connected to the encoder for holding the data provided from the external device;

wherein the control unit holds an address in the buffer

memory of the data provided to the encoder from the buffer
memory immediately before the interruption and permits the
restart of recording if the held address and an address of
the data provided to the encoder match when data preceding
5 the data stored therein during an interruption is provided
to the encoder from the buffer memory before the recording
is restarted.

7. The data recording equipment according to claim 6,
10 wherein the encoder performs an eight-to-fourteen modulation
on data and generates modulated data.

8. The data recoding equipment according to claim 7,
wherein the data recording equipment restarts the recording
15 from a head of a frame in which the recording of data was
interrupted.

9. A data recording controller for controlling
recording of data by irradiating an optical disc with a
20 laser beam and for controlling interruption of the recording
of data when detecting an external shock that hinders the
recording of data or when predicting the occurrence of a
buffer underrun error, the controller comprising:

a counter for counting execution of recording data on
25 the optical disc and generating a count value indicating the
amount of data that is recorded, wherein the count value is
generated from the counter in correspondence with a laser
irradiation position when the optical disc is irradiated
with the laser beam from a position on the optical disc in
30 which data preceding the data recorded immediately before
the interruption is recorded prior to restarting of the
interrupted recording;

a control unit connected to the counter for holding the

count value of the counter immediately before the interruption when the recording of data is interrupted and for comparing the count value, which is generated prior to the restart of the recording, and the count value, which is stored therein, and for restarting the recording of data based on the comparison.

10. The controller according to claim 9, further comprising:

- 10 a decoder for reading disc position information, which is recorded on the optical disc, from a reflection light of the laser beam; and
- a disc position information memory for storing the disc position information read from the decoder when the recording is interrupted;
- 15 wherein the counter includes:
- a first counter for generating a first count value by counting units of a predetermined data amount, the predetermined data amount units each being obtained by dividing a minimum unit of a disc format by a predetermined integer, the disc format including address information, wherein the first counter is initialized when the first count value reaches the minimum unit; and
- 20 a second counter for generating a second count value by counting the data in bit units, wherein the second counter is initialized when the second count value becomes equal to the predetermined data amount unit of the first counter;
- 25 wherein the control unit stores the first counter value of the first counter and the second count value of the second counter and restarts the recording of data when the first and second count values generated prior to the restart
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of the recording matches the first and second count values stored therein after confirming that the disc position information read prior to the restart of the recording matches the disc information position stored in the disc position information memory.

11. The controller according to claim 10, further comprising:

an encoder connected to the control unit for encoding data and generating encoded data in synchronism of the first and second count values of the first and second counters.

12. The controller according to claim 11, wherein the encoder includes the first counter and the second counter.

13. The controller according to claim 12, wherein the encoder performs an eight-to-fourteen modulation on data and generates modulated data.

14. The controller according to claim 9, further comprising:

a decoder for reading disc position information, which is recorded on the optical disc, from a reflection light of the laser beam; and

a disc position information memory for storing the disc position information read from the decoder when the recording is interrupted;

wherein the counter includes:

a first counter for generating a first count value by counting units of a predetermined data amount, the predetermined data amount units each being obtained by dividing a minimum unit of a disc format by a predetermined integer, the disc format including

address information, wherein the first counter is initialized when the first count value reaches the minimum unit; and

5 a second counter for generating a second count value by counting the data in bit units, wherein the second counter is initialized when the second count value becomes equal to the predetermined data amount unit of the first counter;

10 wherein the control unit stores the first count value of the first counter and restarts the recording of data when the first count value generated prior to the restart of the recording matches the first count value stored therein after confirming that the disc position information read prior to the restart of the recording matches the disc information
15 position stored in the disc position information memory.

15. The controller according to claim 14, further comprising:

20 an encoder connected to the control unit for encoding data and generating encoded data in synchronism of the first and second count values of the first and second counters.

25 16. The controller according to claim 15, wherein the encoder includes the first counter and the second counter.

17. The controller according to claim 16, wherein the encoder performs an eight-to-fourteen modulation on data and generates modulated data.

30 18. A method for controlling recording of data by irradiating an optical disc with a laser beam and for interrupting the recording of data when detecting an external shock that hinders the recording of data or when

predicting the occurrence of a buffer underrun error, the method comprising the steps of:

generating a count value in synchronism with execution of recording data on the optical disc indicating the amount of data that is recorded using a counter;

holding the count value of the counter that is generated immediately before the recording of data is interrupted;

irradiating the optical disc with the laser beam from a position on the optical disc in which data preceding the data recorded immediately before the interruption is recorded; and

restarting the recording based on the held count value while recognizing the position of the data in the optical disc.

19. The method according to claim 18, wherein the counter includes:

a first counter for generating a first count value by counting units of a predetermined data amount, the predetermined data amount units each being obtained by dividing a minimum unit of a disc format by a predetermined integer, the disc format including address information, wherein the first counter is initialized when the first count value reaches the minimum unit; and

a second counter for generating a second count value by counting the data in bit units, wherein the second counter is initialized when the second count value becomes equal to the predetermined data amount unit of the first counter;

the method further comprising the steps of:

storing at least the first count value of the first counter and a value related with a history of initialization of the first counter in the memory;

generating the first count value in correspondence with a position irradiated by the laser beam using at least the first counter prior to the restart of the recording;

confirming that the value related with the history of initialization that is stored in the memory matches the position irradiated by the laser beam; and

restarting the recording based on at least the first count value stored in the memory and the first count value generated prior to the restart of the recording.

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20. The method according to claim 18, wherein the counter includes:

a first counter for generating a first count value by counting units of a predetermined data amount, the predetermined data amount units each being obtained by dividing a minimum unit of a disc format by a predetermined integer, the disc format including address information, wherein the first counter is initialized when the first count value reaches the minimum unit; and

a second counter for generating a second count value by counting the data in bit units, wherein the second counter is initialized when the second count value becomes equal to the predetermined data amount unit of the first counter;

the method further comprising the steps of:

storing at least the first count value of the first counter and disc position information recorded on the optical disc in the memory;

reproducing the disc position information from a position irradiated by the laser beam prior to the restart of the recording;

generating the first count value in correspondence with the position irradiated by the laser beam using at least the first counter prior to the restart of the recording;

detecting whether the disc position information stored
in the memory matches reproduced disc information; and

restarting the recording based on at least the first
count value stored in the memory and the first count value
5 generated prior to the restart of the recording.

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